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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/545,834	04/10/2000	Shuhei Harada	Q58793	3167

7590 12/03/2002

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2100 Pennsylvania Avenue NW
Washington, DC 20037-3202

[REDACTED] EXAMINER

TRAN, LY T

ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 12/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/545,834	HARADA ET AL.	
Examiner	Art Unit		
Ly T TRAN	2853		

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on CPA filed 9/20/02.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-88 is/are pending in the application.

4a) Of the above claim(s) 2,3,6-32,42-65 and 75-79 is/are withdrawn from consideration.

5) Claim(s) 1, 4, 33/1, 34/33, 35-37/34, 40/34, 38/37,39/38, 41/33 and 66-68 is/are allowed.

6) Claim(s) 5,69-74,80-84, 88,33/5,34/33,35-37/34,44/33 is/are rejected.

7) Claim(s) 38/37,40/34,85-87 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 9/20/02 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 18 is acceptable and a CPA has been established. An action on the CPA follows.

Election/Restrictions

2. Applicant's election without traverse of species in Paper No. 11 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 5, 69 and 70-74 are rejected under 35 U.S.C. 102(b) as being anticipated by Terasawa et al. (USPN 5,126,766).

With respect to claims 5 and 69, Terasawa et al. discloses an apparatus and a method:

- An ink jet recording head having nozzle orifices from which ink drops are ejected (Column 4: line 24-25);

- An ink storage unit for storing ink to be supplied to the recording head (Column 4: line 22-24);
- An ink flow passage communicating the ink storage unit and the recording head (Fig.1: element 60);
- A valve unit for opening/closing the ink flow passage ((Fig.1: element 52);
- A capping unit for sealing the nozzle orifices (Fig.1: element 21)
- An air valve for opening/closing the air hole (Fig.1: element 20)
- A suction pump for reducing pressure (Fig.1: element 20);
- A control unit for controlling the valve unit, the capping unit and the suction pump unit (Fig1: element 56) such that suction pump decompresses the internal space of the capping unit under a condition that the valve unit closes the ink flow passage and the capping unit seals the nozzle orifice (Fig.8B-8D: shows at the first operation pump, the cap and the supply path are closed) the and the valve unit opens the ink flow passage after a first predetermined time period elapses (Column 6: line 3-19, Fig. 8E);
- The suction pump continues decompressing the internal space of the capping unit for a second predetermined time period (Fig.6C+6D);

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- Wherein the controller controls the capping unit such that the decompressed state of the internal space of the capping unit is maintained while the suction pump is driven (Fig.6D-6E)

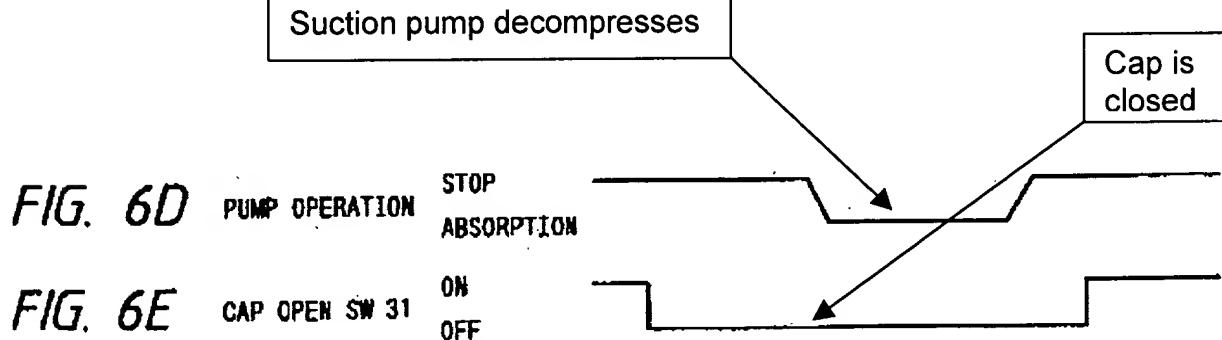
With respect to claim 70, Terasawa et al. discloses a control method wherein the sealing step and the closing step are executed synchronously (Column 6: line 3-6).

With respect to claim 71, Terasawa et al. discloses the step of stopping to drive the suction pump after a second predetermined time period has elapsed since the ink flow passage was opened (Fig.6C-6D).

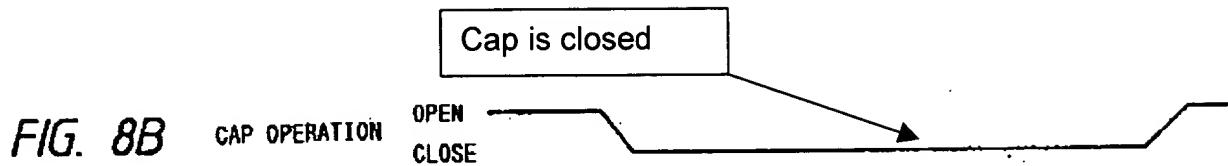
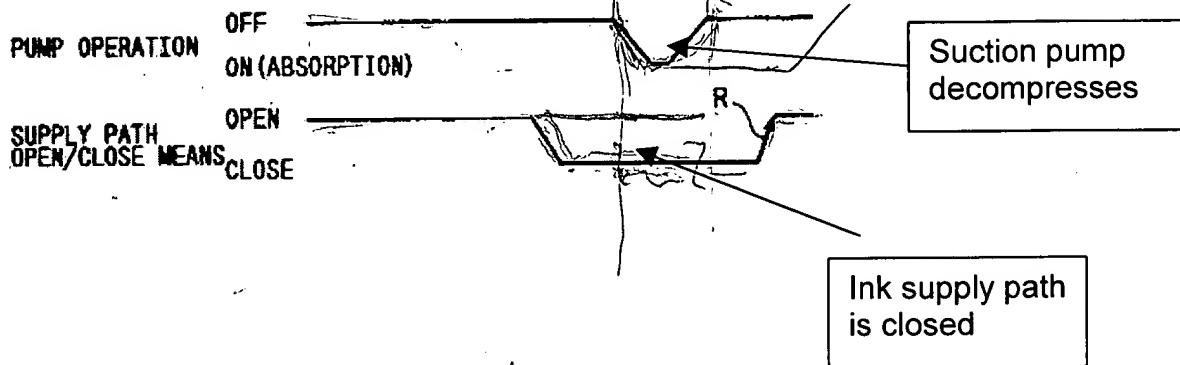
With respect to claim 72, Terasawa et al. discloses the step of driving the suction pump between the sealing step and the closing step (Fig.6C-6E).

With respect to claim 73, Terasawa et al. discloses the step of driving the suction pump again after the stopping step has executed (Fig.6D).

With respect to claim 74, Terasawa et al. discloses step of releasing the capping unit from the nozzle orifices after the suction pump has driven again and driving the suction pump again to discharge ink from the nozzle orifices in a capping released state (Fig.6D-6E).



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**FIG. 8D PUMP OPERATION****FIG. 8E SUPPLY PATH OPEN/CLOSE MEANS**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 33/5, 34/33, 35-37/ 34 and 41/33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasawa et al. (USPN 5,126,766) in view Wu et al. (USPN 5,851,004).

Terasawa et al. teaches an apparatus of a valve unit for opening/closing.

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However, Terasawa et al. fails to teach a valve control chamber, a flexible diaphragm, an actuation body, valve control chamber has an entrance port formed on a top wall thereof at a portion where is away from the center portion of the diaphragm and an exit port formed on the top wall, the entrance port is arranged below the exit port, the circumferential portion of the exit port is tapered, the diaphragm includes an annular convex portion and the actuation body is a rod member.

Wu et al. teaches a valve control chamber (fig.1: element 20), a flexible diaphragm (Fig.3: element 40), an actuation body (Fig.1: element 74+78), valve control chamber has an entrance port formed on a top wall thereof at a portion where is away from the center portion of the diaphragm and an exit port formed on the top wall (Fig.1), the entrance port is arranged below the exit port (Fig.1), the circumferential portion of the exit port is tapered (Fig. 2), the diaphragm includes an annular convex portion (Fig. 2: element 48) and the actuation body is a rod member (Fig. 1: element 70+74).

It would have been obvious to one having ordinary skill in the art to have a valve control chamber, a flexible diaphragm, an actuation body the diaphragm includes an annular convex portion as taught by Wu et al in the invention of Terasawa et al. The motivation of doing so in order to achieves affective sealing of high-pressure gas (Wu et al., Column 3: line 37-55)

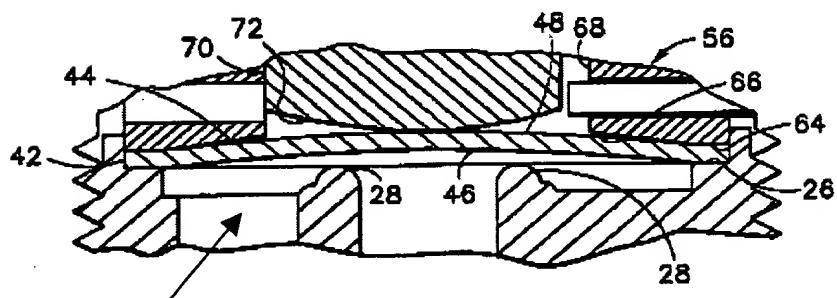
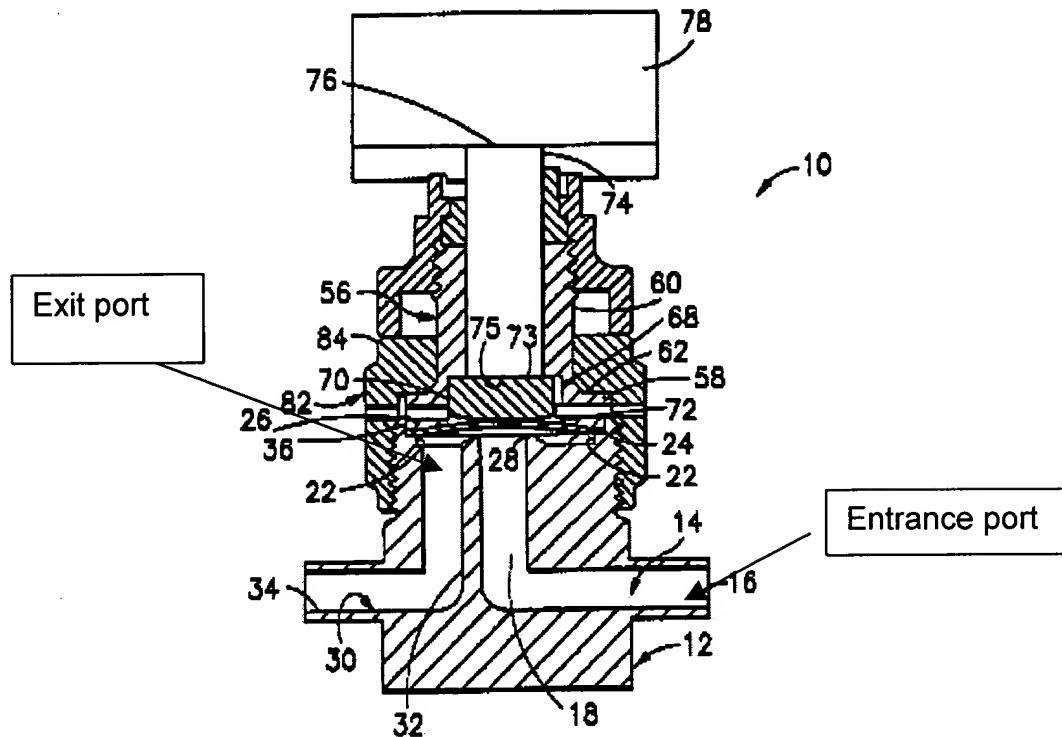


FIG. 2

Exit port is tapered (larger on the top and smaller on the bottom)

5. Claims 80-84 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasawa et al. (USPN 5,126,766) in view of Wu et al. (USPN 5,851,004).

Terasawa et al discloses:

- An ink jet recording head having nozzle orifices from which ink drops are ejected (Column 4: line 24-25);
- An ink storage unit for storing ink to be supplied to the recording head (Column 4: line 22-24);
- An ink flow passage communicating the ink storage unit and the recording head (Fig.1: element 60);
- A valve unit for opening/closing the ink flow passage ((Fig.1: element 52);

However, Terasawa et al. fails to teach a valve control chamber, a flexible diaphragm, which constitute a bottom wall of the valve control chamber and an actuation body for deforming a center portion of the diaphragm in a direction perpendicular thereto, valve control chamber has an entrance port formed on a top wall thereof at a portion where is away from the center portion of the diaphragm and an exit port formed on the top wall, the entrance port is arranged below the exit port, the circumferential portion of the exit port is tapered, the diaphragm includes an annular convex portion and the actuation body is a rod member.

Wu et al. teaches a valve control chamber (fig.1: element 20), a flexible diaphragm (Fig.3: element 40) and an actuation body (Fig.1: element 74+78) valve control chamber has an entrance port formed on a top wall thereof at a portion where is

away from the center portion of the diaphragm and an exit port formed on the top wall (Fig. 1), the entrance port is arranged below the exit port (Fig. 1), the circumferential portion of the exit port is tapered (Fig. 2), the diaphragm includes an annular convex portion (Fig. 2: element 48) and the actuation body is a rod member (Fig. 1: element 70+74).

It would have been obvious to one having ordinary skill in the art to have a valve control chamber, a flexible diaphragm, an actuation body the diaphragm includes an annular convex portion as taught by Wu et al in the invention of Terasawa et al. The motivation of doing so in order to achieves affective sealing of high-pressure gas (Wu et al., Column 3: line 37-55)

Allowable Subject Matter

6. Claims 1, 4, 33/1, 34/33, 35-37/34, 40/34, 38/37,39/38, 41/33 and 66-68 are allowed.

- The primary reason for the allowance of claims 1, 4, 33/1, 34/33, 35-37/34, 40/34, 38/37,39/38, 41/33 and 66-68 is the inclusion of the limitation of an ink jet recording apparatus and a method comprising the air valve always closes the air hole while the suction pump decompresses the internal space of the capping unit. It is limitation found in each claims, as it is claimed in the combination, that has not been found, taught, or

suggested by the prior art of record which makes these claims allowable over the prior art.

7. Claims 38/37, 39/38, 40/34, 85-87 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 38, 39, 85-86 appear to be allowable over the prior art of record because at least prior art has not been found to anticipate an outer peripheral wall of the groove is tapered such that a diameter of thereof is reduced toward the above.

Claims 40 and 87 appear to be allowable over the prior art of record because at least prior art has not been found to anticipate a cross sectional area of the ink flow passage between the exit port and the recording head becomes larger as further from the exit port.

Response to Arguments

8. Applicant's arguments filed 8/22/02 have been fully considered but they are not persuasive.

Applicant's argument that Terasawa et al. does not teach the decompressed state of the internal space of the capping unit maintained while the suction pump is driven is not persuasive. Refer to figure 6D and 6E, clearly shows that the cap is depressed when the pump is operated.

Therefore, Terasawa meets the limitation of the claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ly T TRAN whose telephone number is 703-308-0752. The examiner can normally be reached on M-F (7:30am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 703-308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0967.

November 18, 2002

Ly T Tran
Patent Examiner
Patentology Center 2853